

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims

1. (Currently Amended) A solid supported catalyst for the polymerization of conjugated dienes, comprising a reaction product of
- a. a complex represented by formula $M(Ar)(AlX_4)_3$, where M is a rare earth metal selected from among the metals having an atomic number of between 57 and 71 in Mendeleev's periodic table of elements, selected from the group consisting of lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium. Ar is an aromatic hydrocarbon solvent, Al is aluminum and X is a halogen atom selected from the group consisting of among fluorine, chlorine, bromine and iodine, and
- b. a solid support comprising an inorganic metal oxide compound.
2. (Original) The solid supported catalyst according to Claim 1, wherein the solid support comprises silica.
3. (Currently Amended) The solid supported catalyst according to Claim 1 or 2, further comprising a compound represented by formula AlX_nR_{3-n} , where Al is an aluminum atom, X is a halogen atom, selected from among the group consisting of fluorine, chlorine, bromine and iodine, R is a hydrogen atom or an alkyl group having from 1 to 15 carbon atoms and n is an integer ranging from 0 to 3.

4. (Original) The solid supported catalyst according to Claim 3, wherein $\text{AlX}_n\text{R}_{3-n}$ is triethylaluminum, triisobutylaluminum or diethylaluminum chloride.

5. (Currently Amended) The solid supported catalyst according to Claim 1 wherein the rare earth metal M is neodymium.

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Cont* 6. (Currently Amended) The solid supported catalyst according to Claim 1 or 3 wherein halogen X is chlorine.

7. (Currently Amended) The solid supported catalyst according to Claim 1 wherein the solid support comprises the reaction product of an inorganic metal oxide compound with a Lewis acid of the formula $\text{M}'\text{X}_n$, where n is an integer ranging from 3 to 5, X represents a halogen atom, is selected from the group consisting of among fluorine, chlorine, bromine and iodine and M' is a metal, the atomic number Z of which complies with either of the following two conditions:

$Z \in \{5; 13; 22; 26; 40; 50; 51; 72\}$, or

Z ranging from 57 to 71

selected from the group consisting of boron, aluminum, titanium, iron, zirconium, tin, antimony, hafnium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium.

8. (Currently Amended) The solid supported catalyst according to Claim 7 wherein

metal M' is selected from the group consisting of boron, titanium, iron, aluminum, zirconium, tin, hafnium and antimony.

9. (Currently Amended) A process for the preparation of a solid supported catalyst comprising a reaction product of

a. a complex represented by formula $M(Ar)(AlX_3)$, $M(Ar)(AlX_4)_3$, where M is a rare earth metal selected from among metals having an atomic number of between 57 and 71 in Mendeleev's periodic table of elements selected from the group consisting of lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium, Ar is an aromatic hydrocarbon solvent and X is a halogen selected from among fluorine, chlorine, the group consisting of fluorine, chlorine, bromine and iodine, and

b. a solid support comprising an inorganic metal oxide compound, said processing process comprising

- (i) preparing said solid support,
- (ii) preparing said complex of formula $M(Ar)(AlX_4)_3$ by reacting, in solvent Ar, a halide of rare earth metal M, represented by the formula MX_3 , and a halide of aluminum, represented by the formula AlX_3 , wherein MX_3 and AlX_3 contain the same halogen X, and
- (iii) reacting said complex with said solid support to obtain said catalyst.

10. (Original) The process according to Claim 9, wherein the molar ratio $AlX_3:MX_3$ is greater than or equal to 3.

11. (Original) The process according to Claim 10, wherein the molar ratio is between 4 and 7.

12. (Currently Amended) A process for the preparation of a solid supported catalyst, comprising a reaction product of

a. a complex represented by formula M (Ar) (AlX₃), M (Ar) (AlX₄)₃, where M is a rare earth metal selected from among metals having an atomic number of between 57 and 71 in Mendeleev's periodic table of elements selected from the group consisting of lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium, Ar is an aromatic hydrocarbon solvent and X is a halogen selected from among fluorine, chlorine, the group consisting of fluorine, chlorine, bromine and iodine, and

b. a solid support comprising an inorganic metal oxide compound, said process comprising

(i) reacting the solid support in the aromatic hydrocarbon solvent Ar with an excess of an aluminum halide represented by formula AlX₃ and
(ii) reacting the product of (i) with a halide of the rare earth metal represented by the formula MX₃, wherein AlX₃ and MX₃ contain the same halogen X, in order to form the catalyst comprising complex M(Ar)(AlX₄)₃.

13. (Currently Amended) A process for the preparation of a solid supported catalyst comprising the reaction product of

a. a complex represented by formula M (Ar) (AlX₃), M (Ar) (AlX₄)₃, where

M is a rare earth metal selected from among metals having an atomic number of between 57 and 71 in Mendeleyev's periodic table of elements selected from the group consisting of lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium, Ar is an aromatic hydrocarbon solvent and X is a halogen selected from among fluorine, chlorine, the group consisting of fluorine, chlorine, bromine and iodine, and

b. a solid support comprising an inorganic metal oxide compound, said processing comprising concomitantly reacting, in the aromatic hydrocarbon solvent Ar, said solid support with an excess of aluminum halide AlX_3 , and a halide of rare earth metal represented by the formula MX_3 , wherein AlX_3 and MX_3 contain the same halogen X, in order to form the catalyst comprising complex $\text{M}(\text{Ar})(\text{AlX}_4)_3$.

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14. (Currently Amended) The process according to one any of Claims 9 to 13, further comprising reacting said catalyst with a compound represented by formula $\text{AlX}_n\text{R}_{3-n}$, where Al is an aluminum atom, X is a halogen selected from among fluorine, chlorine, the group consisting of fluorine, chlorine, bromine and iodine, R is a hydrogen atom or an alkyl group having from 1 to 15 carbon atoms and n is an integer which may range ranging from 0 to 3, inclusive.

15. (Original) The process according to Claim 14, wherein $\text{AlX}_n\text{R}_{3-n}$ is triethylaluminum, triisobutylaluminum or diethylaluminum chloride.

16. (Currently Amended) The process according to one any of Claims Claims 9, 12 and or 13, further comprising dehydrating said inorganic metal oxide compound and then partially

dehydroxylating said compound by heat treatment at a temperature of between 300°C and 800°C.

17. (Currently Amended) The process according to ~~one~~ any of ~~Claims~~ Claim 9, 12 and or 13, wherein the solid support comprises the reaction product of an inorganic metal oxide compound with a Lewis acid of the formula $M'X_n$, where n is an integer ranging from 3 to 5, inclusive, X represents a halogen atom, is selected from the group consisting of fluorine, chlorine, bromine and iodine and M' is a metal, the atomic number Z of which complies with either of the following two conditions:

~~Z ∈ {5; 13; 22; 26; 40; 50; 51; 72}~~, or

~~Z ranging from 57 to 71~~

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selected from the group consisting of boron, aluminum, titanium, iron, zirconium, tin, antimony, hafnium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium.

18. (Currently Amended) The process according to Claim 17, wherein said metal M' is selected from the group consisting of boron, titanium, iron, aluminum, zirconium, tin, hafnium or and antimony.

19. (Original) The process according to Claim 17, further comprising reacting said Lewis acid of formula $M'X_n$ in the solid state and in excess with said inorganic metal oxide compound and subliming said acid.

20. (Original) The process according to Claim 17, wherein said Lewis acid of formula $M'X_n$ is reacted in solution in an inert hydrocarbon solvent with said inorganic metal oxide compound.

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21-23. (Cancelled)

24. (New) The solid supported catalyst according to Claim 3 wherein X is chlorine.

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